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RIGHT:

FEEDING OF *PRIACANTHUS TAYENUS* AND *P. MACRACANTHUS* NEAR HONG KONG

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With 4 Tables

Introduction

The big-eyes *Priacanthus tayenus* RICHARDSON and *P. macracanthus* CUVIER form an important part of the Hong Kong pair-trawler fleet catch. They are also taken by long-liners. In the northern part of the South China Sea both species range from Vietnam to the Taiwan Straits, in depths from ten to eighty fathoms. The day-time trawl catch-rate increases at dusk and dawn (sometimes by several hundred percent), but no big-eyes are taken at night.

Material and Methods

Samples were taken from four trawling cruises of the research vessel "Cape St. Mary" (see Table 1).

In May and December the stomach contents were collected immediately after hauling the net. In March and November the contents were removed on return to port, less than two days after capture.

Table 1. Trawling cruises from which samples were taken.

Cruise	Month	No. Hauls	No. fish examined		Area
			<i>P. tayenus</i>	<i>P. macracanthus</i>	
5/67	March '67	10	52	42	60 ml south of H.K., 48 fm.
7/67	May '67	10	355	263	(1) 60 ml south of H.K., 50 fm.
		10			(2) 200 ml south west of H.K., 50 fm.
16/66	Nov. '66	5	54	60	60 ml south of H.K., 48 fm.
18/66	Dec. '66	10	817	488	60 ml south of H.K., 48 fm.

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For each species the fish were divided into three size groups, 15–19 cm, 20–24 cm and 25–30 cm, independent of sex. The fullness of each stomach was recorded to the nearest 5%, a full stomach being 100%. The contents from fish in the same length group were preserved together in alcohol. The percentage composition of the stomach contents was estimated after division of the contents in taxonomic groups.

Table 2. Percentage composition by volume of stomach contents of *P. tayenus* & *P. macracanthus*.

Month:	March		May		November		December	
	P.t.	P.m.	P.t.	P.m.	P.t.	P.m.	P.t.	P.m.
Crustacea								
Shrimp, 1–3 cm	5	9	16	23	16	4	15	23
Shrimp, 3+ cm	—	—	15	2	—	—	7	—
Stomatopod	17	12	5	13	—	—	5	3
Portunid	1	2	5	+	—	2	2	2
Isopod	—	2	1	1	1	+	1	+
Ostracod	1	—	4	2	—	—	+	—
Megalopa	14	12	+	2	—	1	+	+
Alpheid	—	—	+	—	—	1	+	—
Thenoid	—	—	1	—	3	—	+	—
Copepod	4	4	—	—	—	—	—	—
Gammarid	2	4	3	4	—	1	+	—
Cumacid	+	—	—	—	—	—	—	—
Other crabs	—	—	+	—	5	1	+	—
<i>Lepas</i>	—	—	+	—	—	—	+	—
Mysid	—	—	+	—	—	—	—	—
Unidentified	24	9	15	26	—	8	0	7
Total:	68	54	66	73	25	18	31	35
Fish								
Eels	5	—	+	—	—	7	5	1
Larvae	2	2	1	4	—	—	+	+
<i>Champsodon?</i>	—	—	—	—	—	—	4	3
Sardine?	—	—	1	—	—	—	2	—
Flatheads?	—	—	—	—	—	—	2	—
Pegasus	—	—	—	—	—	—	+	—
Flatfish	—	—	—	—	—	—	+	—
<i>Caranx</i> (+ <i>Leiognathus</i>)	—	—	3	—	—	5	2	1
<i>Apogon</i>	—	—	1	—	—	—	+	+
<i>Uranoscopus</i>	—	—	+	—	—	—	—	—
Small fish unid.	9	—	10	2	—	—	+	—
Fish lumps	+	—	3	1	—	—	2	+
Fish remains	4	12	4	+	24	16	2	2
Total:	20	14	23	7	24	28	20	7

Table 2. Continued

Month:	March		May		November		December	
	P.t.	P.m.	P.t.	P.m.	P.t.	P.m.	P.t.	P.m.
Mollusc								
Octopus	—	—	—	—	—	—	1	—
Squid	1	—	1	1	6	16	4	4
<i>Ianthina</i>	6	5	1	1	—	+	+	1
Pteropod	—	—	—	2	—	—	—	—
Total:	7	5	2	4	6	16	5	5
Ascidian	—	—	—	1	43	36	44	53
Nereids	3	27	8	6	2	—	+	—
<i>Amphitrite</i>	—	—	+	—	—	—	—	—
Other worms	—	—	+	—	—	—	—	—
Hydroid	1	—	—	2	—	—	—	—
Pennatulid	+	—	—	—	—	—	—	—
Egg masses	—	—	+	—	—	—	—	—
Mud	—	—	—	5	—	—	—	—
Gelatinous material	—	—	—	1	—	—	—	—
Formins fera	—	—	—	+	—	+	—	—
Nylon	—	—	—	—	—	—	+	+
Unidentified	0.36	0.64	0.12	0.20	0.26	0.27	0.07	0.06

Results

Four *P. tayenus* and one *P. macracanthus* in December had everted stomachs.

The percentage composition of stomach contents by volume from all fish examined in each sample is shown in Table 2. The March and November samples were in poor condition as indicated by the high proportion of unidentifiable matter.

The *P. tayenus* March and May samples contained high proportions of Crustacea (68 and 66%) supplemented by fish (21 and 23%). Stomatopods, large and small shrimps (particularly *Leptochela* sp.) and small fish predominated. In November and December the percentage fish was similar but the percentage Crustacea dropped and colonial ascidians of the family Polycitoridae were important. The larger *P. tayenus* took a higher proportion of fish (Table 3).

In *P. macracanthus* also the main foods were Crustacea in March and in December, colonial ascidians. The size of food items was generally smaller than that of *P. tayenus*, large shrimps and whole fish occurring only occasionally.

In both species there is a tendency for the stomachs of the larger fish to be less full than those of the smaller (Table 3).

Small gastropods 3–4 mm in length, including some *Ianthina* sp., occurred frequently in stomachs from March and May, but by volume they were insignificant.

Table 3. Food composition of the two species of big-eyes.

Size of fish (in cm)	<i>P. layenus</i>								<i>P. macracanthus</i>							
	No. fish	Fullness average	Fish %	Crust. %	Moll. %	Nereids %	Ascidians %	Other %	No. fish	Fullness average	Fish %	Crust. %	Moll. %	Nereids %	Ascidians %	Other %
March																
15-19	14	—	0	34	11	1	—	54	0	—	—	—	—	—	—	—
20-24	30	—	12	50	3	3	—	32	30	—	7	22	2	10	—	59
25-29	8	—	41	36	2	1	—	20	12	—	0	14	1	10	—	75
May																
1st ground																
15-19	76	49%	25	56	1	1	—	17	37	37%	10	70	7	2	—	11
20-24	82	42	14	64	3	1	—	18	113	22	3	68	4	3	2	20
25-29	74	40	19	69	1	2	—	9	113	19	9	43	2	7	6	32
2nd ground																
15-19	14	32	5	20	+	60	—	15	0	—	—	—	—	—	—	—
20-24	43	30	24	50	1	17	—	8	0	—	—	—	—	—	—	—
25-29	66	37	11	61	1	22	—	5	20	13	2	63	1	16	—	18
November																
15-19	14	44	8	7	—	—	70	15	20	23	—	20	35	—	—	45
20-24	20	33	18	29	3	—	17	33	20	23	10	13	2	—	55	20
25-29	20	24	30	20	13	6	—	31	20	23	50	9	—	—	25	16
December																
15-19	210	41	5	19	11	+	62	3	20	57	—	33	—	—	64	3
20-24	332	33	15	36	3	—	37	9	202	40	6	49	1	—	35	9
25-29	279	23	47	38	3	—	3	9	265	46	7	23	7	—	59	4

During August a small argonaut was taken from the stomach of a 20–24 cm *P. tayenus*.

The fullness of the stomachs at dawn, dusk and during the day time are shown for two cruises (Table 4). The few big-eyes taken at night had little food in the stomach.

The dusk rise in catch-rate coincided with a slight drop in percent fullness.

Discussion

Benthic animals constitute the majority of the food organisms. The only predominantly mid-water organisms found were pteropods. The reason for the increase in vulnerability to trawls at dusk was not discovered but it does not appear to be related to feeding intensity or fish size. Hong Kong long-liners take big-eyes on squid and small fish baits and they never fish for them at night.

Colonial ascidians of the family Polycitoridae as found in November and December in the stomachs of both species have been recorded from stomachs of small *Lutjanus aya* BLOCH from Brazil (BARROSO, 1965).

Conclusions

The big-eyes *P. tayenus* and *P. macracanthus* have similar diets and probably compete directly. *P. tayenus*, however, tends to take slightly larger organisms.

The food of both species consists mainly of shrimps 1–3 cm long and stomatopods, small fish and colonial ascidians of the family Polycitoridae.

They feed predominantly near the bottom during the day time. No evidence was found of night feeding and no relationship was discovered between high dusk catch-rates (lb/hr) and feeding intensity.

Table 4. Average percentage fullness of stomach and catch-rates (lb/hr).

		<i>P. tayenus</i>			<i>P. macracanthus</i>		
May		Dawn	Day	Dusk	Dawn	Day	Dusk
Ground (1)	Fullness	—	42%	44%	—	27%	10%
	No. fish	—	100	132	—	171	75
	lb/hr	—	2	20	—	20	20
Ground (2)	Fullness	—	34%	34%	—	16%	15%
	No. fish	—	18	105	—	4	19
	lb/hr	—	$\frac{1}{2}$	5	—	$\frac{1}{2}$	6
December							
	Fullness	35%	37%	27%	42%	45%	32%
	No. fish	210	292	176			
	lb/hr	47	13	68	34	63	106

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